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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/005,731	11/06/2001	Merle R. Beghtel	SVL920010072US1	9148
24852	7590	12/12/2005	EXAMINER	
INTERNATIONAL BUSINESS MACHINES CORP IP LAW 555 BAILEY AVENUE , J46/G4 SAN JOSE, CA 95141			ALI, SYED J	
			ART UNIT	PAPER NUMBER
			2195	

DATE MAILED: 12/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/005,731	Applicant(s) BEGHTEL ET AL.	
	Examiner Syed J. Ali	Art Unit 2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to the amendment filed August 29, 2005. Claims 1-22 are presented for examination.

2. The text of those sections of Title 35, U.S. code not included in this office action can be found in a prior office action.

Claim Rejections - 35 USC § 103

3. **Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruno et al. (USPN 5,999,963) (hereinafter Bruno) in view of Rajkumar (US 2003/0061260).**

4. As per claim 1, Bruno teaches the invention as claimed, including a method for self-throttling the use of computer resources by a computer task executing on a computer system, said method comprising:

receiving by said computer task a throttle specification for directing said computer task's usage of said computer resources (col. 5 lines 52-53, 60-65; col. 8 lines 23-27);

executing said computer task until a first unit of work is completed (col. 8 lines 47-52; col. 15 lines 12-14), said computer task comprising said first unit of work and at least a second unit of work (col. 4 lines 25-35);

calculating the elapsed time of said first unit of work (col. 10 lines 40-42);

calculating a suspension time for said computer task based at least partially on said throttle specification and said elapsed time (col. 10 lines 42-44); and

suspending said computer task for said calculated suspension time prior to resuming execution of said computer task (col. 11 lines 34-37), whereby other computing tasks within said computer system gain access to said computer resources during said suspension of said computer task (col. 11 lines 22-27).

5. There is a notable difference between Bruno and the claimed invention, in that Bruno runs a process for a bounded amount of time, leaving the process susceptible to preemption or termination (col. 10 lines 38-44). On the other hand, the claimed invention runs a process until a first unit of work is completed before voluntarily yielding. The scheduling method of Bruno is similar, in that a decision epoch occurs alternatively at the end of the current quantum, the end of the current preemption interval, or the completion of a phase of the current running process (col. 15 lines 12-14). The last period corresponds to the claimed method of yielding at the end of a first unit of work, but Bruno is distinguishable in that if the allocated period of time has not expired, the process continues to run (col. 15 lines 15-20). This could lead to the problem of a process being preempted or terminated in the middle of executing a phase, but Bruno is unable to solve this problem due to the bounded period of execution.

6. Rajkumar solves the deficiencies of Bruno by demonstrating how a soft reservation can be used to allow a task to renew its reservation to complete its required processing during the current scheduling interval (paragraphs 0055-60). Variables are introduced to ensure that the overall reservation scheme is not violated. Combining Rajkumar's method of renewal with Bruno's scheduling would allow a task to complete its current phase or critical tasks, e.g. to meet a hard deadline in a real-time system, while maintaining the cumulative service guarantee that Bruno indicates is of such great importance. Whereas Bruno inherently calculates a suspension

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time by always running a process for an amount of time that is in line with its service fraction, a simple algebraic computation can be used to determine the amount of time to suspend the process (alternatively the suspension time can be thought of as the amount of time granted to other processes). Accordingly, it would have been obvious to a person having ordinary skill in the art to combine Bruno and Rajkumar since real-time tasks often have hard deadlines that require a task to complete by a certain deadline; allowing the task to complete the desired amount of work, while ensuring that the resource is not monopolized, would be an ideal way to solve this problem (Bruno and Rajkumar are both concerned with meeting scheduling constraints for real-time tasks, thereby suggesting the references be combined; Bruno, col. 1 lines 51-63; Rajkumar, paragraphs 0005, 0022).

7. As per claim 2, Bruno teaches the invention as claimed, including the method of claim 1 further comprising resuming execution of said computer task and commencing said second unit of work following the exhaustion of said suspension time (col. 7 lines 46-51, wherein the process will not come to the head of the list until all other processes have had their service requirements met, i.e. the suspension times is analogous to the amount of time needed to run the other tasks).

8. As per claims 3-4, Bruno teaches the invention as claimed, including the method of claim 2 wherein said computer task performs a database reorganization on an IMS HALDB database (col. 3 line 58 - col. 4 line 3, any type of task or process can be used in the scheduler).

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9. As per claim 5, Bruno teaches the invention as claimed, including the method of claim 1 wherein said throttle specification is a percentage value, said percentage value representing the percentage of said computer resources on said computer system to be dedicated to said computer task (col. 1 lines 37-49; col. 5 lines 52-62).

10. As per claim 6, Bruno impliedly teaches the invention as claimed, including the method wherein said suspension time is calculated by using the formula $st = (et * (100 - pv)) / pv$, where st is said suspension time, et is said elapsed time and pv is said percentage value. Bruno does not calculate suspension time in exactly this manner, but a brief explanation will show that the claimed formula is a simple algebraic derivation of the scheduling method of Bruno that would have been obvious to a person having ordinary skill in the art.

11. Bruno teaches each process in the schedule having a guaranteed service fraction that is less than 1 (col. 8 lines 22-5). The sum of the service fractions of all processes equals 1 (col. 8 lines 25-27). The amount of time spent servicing the “current” process is equated to et , while the amount of time spent servicing the remaining processes is the same amount of time that the current process is suspended (st). The relationship between the execution time of the “current” process and its service fraction is the same as the relationship between the sum of execution times of remaining processes and their cumulative service fractions, i.e. elapsed time/service fraction = suspend time/(1 - service fraction). Multiplying both sides of the equation by (1 - service fraction) yields the claimed suspension time.

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12. As per claim 7, Bruno teaches the invention as claimed, including the method of claim 1 wherein said computer task self-throttles the usage of said computer resources by said computer task in accordance with said throttle specification (col. 10 lines 38-44).

13. As per claim 8, Bruno teaches the invention as claimed, including a method for throttling the use of computer resources on a computer system during a database reorganization process comprising:

establishing a percentage of said computer resources on said computer system to be used for said database reorganization process (col. 5 lines 52-53, 60-65; col. 8 lines 23-27, wherein the only difference between Bruno and claim 8 is that the task is a database reorganization, but Bruno allows any type of task or process to be used in the scheduler);

utilizing said percentage in a throttle specification (col. 11 lines 22-27, 34-37);

invoking said database reorganization process and providing said throttle specification wherein said percentage is passed to a self-throttled computing task in said throttle specification (col. 5 lines 52-53, 60-65; col. 8 lines 23-27); and

prior to receiving notification that said database reorganization process is complete, initiating a transaction on said computer system wherein said transaction completes within a predetermined response time objective (col. 1 lines 51-63; col. 10 lines 39-44).

14. As per claims 9-15, Bruno teaches the invention as claimed, including an article of manufacture for use in a computer system tangibly embodying computer instructions executable by said computer system to perform the method of claims 1-7, respectively (Fig. 1).

15. As per claims 16-22, Bruno teaches the invention as claimed, including a computer system for self-throttling the use of computer resources by a computer task executing on said computer system, said computer system comprising:

a computer (Fig. 1); and

computer program instructions for performing the method of claims 1-7, respectively (Fig. 1).

Response to Arguments

16. **Applicant's arguments with respect to claims 1-22 have been considered but are moot in view of the new grounds of rejection.**

Conclusion


17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Syed J. Ali whose telephone number is (571) 272-3769. The examiner can normally be reached on Mon-Fri 8-5:30, 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai T. An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Syed Ali
November 29, 2005



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